

CLAIMS

1. A transgenic cell wherein the genome of said cell comprises a nucleic acid molecule wherein said nucleic acid molecule is selected from the group consisting of;
5 i) a nucleic acid molecule comprising a nucleic acid sequence as represented in Figure 1;
 ii) a nucleic acid molecule comprising a nucleic acid sequence which hybridises to the sequence in (i) above and which glucosylates at least one monolignol;
10 iii) a nucleic acid molecule comprising a nucleic acid sequences which are degenerate as a result of the genetic code to the sequences defined in (i) and (ii) above.
2. A cell according to Claim 1 wherein said aldehyde of a monolignol is selected
15 from the group consisting of; *p*-coumaryl aldehyde, coniferyl aldehyde and sinapyl aldehyde.
3. A cell according to Claim 2 wherein said monolignol is coniferyl alcohol.
- 20 4. A cell according to any of Claims 1-3 wherein said nucleic acid is cDNA.
5. A cell according to any of Claims 1-3 wherein said nucleic acid is genomic DNA.
- 25 6. A cell according to any of Claims 1-5 wherein said nucleic acid molecule comprises a nucleic acid sequence as shown in Figure 1.
7. A cell according to any of Claims 1-4 wherein said nucleic acid molecule consists of a nucleic acid sequence as shown in Figure 1.
- 30 8. A cell according to any of Claims 1-7 wherein said nucleic acid molecule is over expressed.

9. A cell according to Claim 8 wherein said cell over-expresses a nucleic acid molecule selected from the group consisting of:

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i) a nucleic acid molecule comprising a nucleic acid sequence as represented in Figure 1 and Figure 3 and/or Figure 5;

ii) a nucleic acid molecule comprising a nucleic acid sequence which hybridises to the sequence in (i) above and which glucosylates at least one monolignol;

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iii) a nucleic acid molecule comprising a nucleic acid sequences which are degenerate as a result of the genetic code to the sequences defined in (i) and (ii) above.

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10. A cell according to Claim 8 wherein said cell over-expresses a nucleic acid molecule as represented by the nucleic acid sequence shown in Figure 3 and Figure 5, or a nucleic acid molecule which hybridises to a nucleic acid molecule as represented by the nucleic acid sequence in Figure 3 and Figure 5.

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11. A cell according to any of Claims 1-7 wherein the expression of said nucleic acid molecule is down-regulated to reduce glucosyltransferase activity in said cell.

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12. A cell according to Claim 11 wherein said down-regulation is as a result of said cell being null for a nucleic acid molecule selected from the group consisting of;

i) a nucleic acid molecule comprising a nucleic acid sequence as represented in Figure 1;

ii) a nucleic acid molecule comprising a nucleic acid sequence which hybridises to the sequence in (i) above;

iii) a nucleic acid molecule comprising a nucleic acid sequences which are degenerate as a result of the genetic code to the sequences defined in (i) and (ii) above.

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13. A cell according to Claim 11 wherein said down-regulation is as a result of said cell being null for a nucleic acid molecule selected from the group consisting of;

- i) a nucleic acid molecule comprising a nucleic acid sequence as represented in Figure 1 and Figure 3 and/or Figure 5;
- ii) a nucleic acid molecule comprising a nucleic acid sequence which hybridises to the sequence in (i) above;
- iii) a nucleic acid molecule comprising a nucleic acid sequences which are degenerate as a result of the genetic code to the sequences defined in (i) and (ii) above.

14. A cell according to Claim 11 wherein said down-regulation is the result of said cell being null for a nucleic acid molecule comprising a nucleic acid sequence as shown in Figure 3 and Figure 5, or a nucleic acid molecule which hybridises to a nucleic acid molecule comprising a nucleic acid sequence as shown in Figure 3 and Figure 5.

15. A cell according to Claim 11 wherein said cell is transformed with a nucleic acid molecule comprising an expression cassette which cassette comprises a nucleic acid sequence selected from the group consisting of:

- i) a nucleic acid molecule comprising a nucleic acid sequence as represented in Figure 1;
- iv) a nucleic acid molecule comprising a nucleic acid sequence which hybridises to the sequence in (i) above and which glucosylates at least one monolignol;
- iii) a nucleic acid molecule comprising a nucleic acid sequences which are degenerate as a result of the genetic code to the sequences defined in (i) and (ii) above.

wherein said cassette is adapted such that both sense and antisense nucleic acid molecules are transcribed from said cassette.

16. A cell according to Claim 15 wherein said cassette is provided with at least two promoters adapted to transcribe sense and antisense strands of said nucleic acid molecule.

17. A cell according to Claim 15 wherein said cassette comprises a nucleic acid molecule wherein said molecule comprises a first part linked to a second part wherein said first and second parts are complementary over at least part of their sequence and further wherein transcription of said nucleic acid molecule produces an RNA molecule which forms a double stranded region by complementary base pairing of said first and second parts.

18. A cell according to Claim 17 wherein said first and second parts are linked by at least one nucleotide base.

19. A cell according to Claim 11 wherein said cell is transformed with a nucleic acid molecule comprising an expression cassette(s) which cassette(s) comprises a nucleic acid sequence selected from the group consisting of:

- i) a nucleic acid molecule comprising a nucleic acid sequence as represented in Figure 1 and Figure 3 and/or Figure 5;
- ii) a nucleic acid molecule comprising a nucleic acid sequence which hybridises to the sequence in (i) above and which glucosylates at least one monolignol;
- iii) a nucleic acid molecule comprising a nucleic acid sequences which are degenerate as a result of the genetic code to the sequences defined in (i) and (ii) above.

wherein said cassette is adapted such that both sense and antisense nucleic acid molecules are transcribed from said cassette.

20. A cell according to Claim 19 wherein said cassette(s) comprises a nucleic acid molecule comprising a nucleic acid sequence as shown in Figure 3 and Figure 5 or a nucleic acid molecule which hybridises to a nucleic acid molecule comprising a nucleic acid sequence as shown in Figure 3 and Figure 5.

21. A cell according to any of Claims 12-20 wherein said expression cassette is part of a vector.

22. A cell according to any of Claims 1-21 wherein said transgenic cell is a eukaryotic cell.

23. A cell according to Claim 22 wherein said cell is a plant cell.

24. A transgenic plant comprising a cell according to Claim 23.

25. A plant according to Claim 24 wherein said plant is a woody plant selected from: poplar; eucalyptus; Douglas fir; pine; walnut; ash; birch; oak; teak; spruce.

26. A method for modulating the lignin content of a plant comprising the steps of;

- i) providing a cell according to any of Claims 1-23,
- ii) providing conditions conducive to growth of said cell into a plantlet and optionally,
- iii) determining the lignin content of said plant.

27. A method of manufacture of paper or board from a transgenic plant exhibiting an altered lignin content comprising the steps of;

- i) pulping the transgenic wood material derived from the transgenic plant according to Claim 24 ; and
- ii) producing paper from said pulped transgenic wood material.